DOCUMENT RESUME

ED 331 032 CS 010 550

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TITLE The Effects of Audiotaped Progressive Muscle Relaxation Training on the Reading Performance of Emotionally Disturbed Adolescents.
PUB DATE 90
NOTE 16p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adolescents; *Audiotape Recordings; *Emotional Disturbances; Oral Reading; *Reading Achievement; Reading Research; *Relaxation Training; Secondary Education; Silent Reading
IDENTIFIERS Progressive Muscle Relaxation Training; Relaxation

ABSTRACT

A study examined the degree to which audiotaped progressive muscle relaxation training influenced the oral and silent reading performance of eight adolescents who were legally classified as emotionally disturbed. A single-case ABAB withdrawal design was used to examine the effects of relaxation training on oral reading. In addition, a quasi-experimental between-subjects pretest-posttest design was used to contrast the effects of relaxation training and group counseling on the Total Reading Score of the Metropolitan Achievement Test (MAT). Withdrawal design findings indicated that relaxation training positively influenced oral reading performance. Between-subjects comparisons showed that the relaxation group did significantly better on the MAT posttest than the counseling group. (One table of data and two figures are included and 27 references are attached.) (Author/MG)

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The Effects of Audiotaped Progressive Muscle Relaxation Training on the Reading Performance of Emotionally Disturbed Adolescents

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Abstract

The present investigation examined the degree to which audiotaped progressive muscle relaxation training influenced the oral and silent reading performance of adolescents who were legally classified as emotionally disturbed. A single-case ABAB withdrawal design was used to examine the effects of relaxation training on oral reading. In addition, a quasi-experimental between-subjects pretest-posttest design was used to contrast the effects of relaxation training and group counseling on the Total Reading Score of the Metropolitan Achievement Test. Withdrawal design findings indicated that relaxation training positively influenced oral reading performance. Between-subjects comparisons showed that the relaxation group did significantly better on the MAT posttest than the counseling group.

One of the most difficult challenges educators face is teaching adolescents with significant emotional problems. Students classified as emotionally disturbed often present a variety of behavioral and academic difficulties. Over the years, numerous approaches (e.g., behavior modification, counseling, pharmaceutical therapy) have been used with varying degrees of success. Recently, a spate of promising research has examined the effects of relaxation training on hyperactivity, self-concept, anxiety, attention-to-task, conduct, and reading achievement (Margolis, 1987; Margolis, 1988; Margolis and Pica, 1987). Unfortunately, little of this research has considered emotionally disturbed adolescents, a population which might benefit greatly from the regular use of relaxation procedures to improve academic performance.

The present investigation examined the degree to which audiotaped progressive muscle relaxation (PMR) training influenced the performance of adolescents legally classified as emotionally disturbed on measures of oral and silent reading. Reading was chosen as a dependent variable because it is central to success in school. Counseling was employed as a placebo treatment to control for the possible influences of expectation, support, suggestion, and attention. As Borkovec,

Johnson, and Block (1984) noted, "Without such groups, we are left in the dark about the role of extratherapeutic aspects of our treatment" (p. 374).

PMR is based on two of Jacobson's (1938) premises: (1) one cannot be simultaneously relaxed and stressed, and (2) mental relaxation is a natural consequence of physical relaxation. Chronically anxious students are usually unaware of their elevated muscular tension levels. By sitting and alternately tensing and relaxing major muscle groups for brief periods of time (e.g., tense right hand into a fist five to eight seconds and relax it for 15 seconds) it is anticipated that people learn to discern when muscles are tensed and relaxed. Because muscles relax more easily and completely immediately after contraction, proficiency in relaxing muscles at will is facilitated. As competence develops, muscle groups can be combined and willful tensing gradually eliminated (Charlesworth & Nathan, 1984).

Unlike the vast majority of extant research, a single-case ABAB research design was used in combination with a between-subjects comparison design to assess the effects of PMR training on individuals as well as groups. Borkovec and Bernstein (1985) noted the importance of examining the effects of relaxation on individuals. "Group outcome research," they wrote, "in which the average effects of one relaxation strategy on several people are compared to the average effects on people treated by a different technique, obscures what is happening to any given individual. Information about those who responded to a particular strategy either not at all or exceptionally well is lost" (p. xi). Analogously, Deno (1986) cautioned that "using group evaluation designs to determine experimentally the effectiveness of varying treatments for the individual not only yields the wrong data for testing individual effects, but also is infeasible in special and regular education programs" (p. 361). Between-subjects designs can mask or obscure important changes in individuals which are not representative of the group at large, thus providing spurious information about the effect of treatment on individuals (Barlow, Blanchard, Hayes, & Epstein, 1977; Kazdin, 1982).

Given these admonitions and the fact that people are usually not influenced equally by treatments, the single-case facet of the design used a criterion-referenced dependent variable to assess oral reading growth. This measure was designed to be administered repeatedly without diminishing its validity, allowing for more precise assessment of individual development over time than possible with between-subjects comparisons employing norm-referenced measures. Administrative procedures and support for its validity will be discussed below.

Subjects and Setting

Eight adolescents, attending a private day school for students classified as emotionally disturbed, were assigned to a PMR or counseling group, in as random a fashion as possible. Scheduling difficulties precluded *full* randomization.

Students at this school typically manifested significant academic as well as emotional difficulties. Although not a criterion for inclusion in the study, three of the four participating students in each group fell within the reading disabled or underachieving categories when Harris Reading Expectancy Quotients (REQ) and Reading Quotients were computed using student's Metropolitan Achievement Test (MAT) Advanced Battery Total Reading Score, mental age (derived from the WISC-R Full Scale IQ), and chronological age. The REQ for the remaining member of each group fell at the criterion for "normal limits" (REQ = 90) or slightly above (REQ = 93) (McGinnis & Smith, 1982, p. 33).

The school was located in an upper middle class suburban area in southern New Jersey. However, student sending districts represented a wide socioeconomic range of neighborhoods from several counties. The school served more than 250 students, age six to 19. An intensive behavior modification program employing a token and response cost system permeated every aspect of the school's program.

The Mann-Whitney Rank Sum Test indicated there were no significant pre-intervention differences at the .15 level (reasons for choosing an alpha level of .15 are discussed later under Findings - Group Comparisons) between the relaxation (r) and counseling (c) groups on age ($\bar{X}r = 14.85$, $\bar{X}c = 15.60$; $p = .44$), WISC-R Full Scale IQ ($\bar{X}r = 98.75$, $\bar{X}c = 95.75$; $p = .24$), or the Total Reading Score grade equivalent of the MAT ($\bar{X}r = 7.60$, $\bar{X}c = 6.40$; $p = .24$).

Method

Research Design

Students were chosen for participation from the school's total enrollment by the Supervisor of Clinical Services, based on needs articulated in student IEPs. Only students who were judged "highly anxious" *prior* to the study, by the school's doctoral level psychologist, were considered prospective participants. In addition to the requirement that the psychologist had to know each of these students fairly well, student records, child study team reports, and direct observations were used to make the determination of anxiety. Within these constraints and that of scheduling, assignment from this pool to the counseling or PMR group was made on as random a basis as possible. This resulted in assigning three boys and one girl to each group. No attempt was made to balance the groups for gender. Although strict randomization was not used, the pre-intervention data showed that the groups were similar in all areas measured.

To comply with the logistics of the school situation and the requirements of student IEPs, a combination between-subjects and single-case design was used. The between-subjects aspect compared the effects of group PMR training and group counseling on the Total Reading Score grade equivalents of the MAT. Only the relaxation group was involved with the single-case ABAB (i.e., Baseline, Phase I Treatment, Withdrawal, Phase II Treatment) component. This within-group aspect assessed the effects of relaxation and its withdrawal on oral reading.

Procedures

The MAT was administered in September and late May by classroom teachers under the auspices of the school's reading specialist. WISC-R scores were taken from recent psychological evaluations submitted by school district personnel and reviewed by the private school's Supervisor of Clinical Services, who held a doctorate in school psychology and taught graduate courses in intelligence testing.

All treatment sessions took place in a 10 x 10 foot counseling room outside of class. Students assigned to PMR training met with a school psychologist for two 20-minute group sessions weekly. Those involved in counseling met weekly with the same psychologist for one 45-minute group counseling session. The experiment began in early October and ended the last week in May. Excluding baseline and withdrawal sessions, relaxation students averaged 27.50 (SD = 3.69) treatment sessions, for an average of 9.17 hours of direct relaxation training. Counseling students averaged 20.50 sessions (SD = 5.19), for an average of 15.38 hours of counseling. Thus, the time consumed by direct PMR treatment averaged 60% of that devoted to counseling (9.17/15.38 = 60%).

Due to calendar and attendance constraints, baseline averaged 2.2 weeks in duration, Phase I Treatment 13.5 weeks, Withdrawal 5.5 weeks, and Phase II Treatment 10.5 weeks. In terms of oral reading, Baseline and Withdrawal averaged 5.25 (SD = .95) and 5.50 (SD = 1.00) observations respectively. The means and standard deviations for Phase I and Phase II treatment sessions, with their associated observations, were 16.75 (SD = 2.50) and 10.75 (SD = 1.25) respectively.

At the end of each relaxation and counseling session, students read aloud individually for exactly one minute from basal readers at their instructional level. The selection read was new to the student, was not previewed by the student prior to oral reading, and was assigned by the school psychologist. The basal texts were otherwise inaccessible to participants and were different for each student. While the student read aloud, the psychologist tallied the number of words correctly read.

Lupin's (1977) tape, "Children's Relaxation Exercises," was used to elicit PMR. According to Lupin, this tape helps students learn "to identify tension by contrasting feelings of tension and relaxation" (p. 23). Following is a typical portion of the tape's script: "Keeping the rest of your body relaxed and your toes straight up, you are going to press your heels into the floor. Now as hard as you can press your heels down as though you were trying to make them go through the floor. Hold it:

[one second per count] one, two, three, four, five . . . Relax your legs and let your body go limp. Take a deep breath. Hold it [six second pause] . . . and then let go . . . Now pull your toes toward your face as hard as you can. Feel the tension in the back of your legs . . ."

In early December one student in the relaxation group requested to continue PMR training without the tape. This was agreed to. The school psychologist observed that the student continued to maintain full involvement in the exercises and continued to execute them correctly without the tape. Teachers not involved in the program noted in daily anecdotal records (kept on all students as per school policy) and on the student's report card that she voluntarily practiced PMR on her own throughout the day (e.g., before tests, while reading content area assignments).

To introduce variety into treatment and capitalize on the motivational power of choice (Cameron, 1983; Kessler, 1966; Smith, 1986), students were allowed to listen to three other tapes in the Lupin series during Phase II Treatment of the ABAB design (i.e., the reintroduction of treatment after withdrawal). More specifically, during the first session of this phase, students listened to the original tape, "Children's Relaxation Exercises." During the next three sessions they selected whatever tape they wanted to listen to from "Trip to the Beach," "Walk in the Woods," or "Trip to the Mountains." After the fourth session, they returned to the original tape for the remainder of the experiment. As is often the case with PMR, some students in the relaxation treatment started to combine muscle groups while engaging in the exercises during Phase II Treatment.

Group counseling adhered to the tenets of Reality Therapy (Glasser, 1965). After interacting with students and demonstrating sincere interest, the counselor helped individual students identify priority problems, establish realistic goals, formulate step-by-step implementation plans, follow-through, and overcome obstacles without lessening responsibility.

Criterion-Referenced Oral Reading Dependent Variable

Because single-case research designs are strengthened when progress is assessed on a continuous basis (Kazdin, 1982; Kratochwill 1985), a valid index of reading ability, sensitive to small increments of growth and reliable over repeated measures, was sought.

The number of correctly pronounced words from one minute of oral reading was selected, based on work by Deno (1985), Deno, Marston, Shinn, and Tindal (1983), and Deno, Mirkin, and Chiang (1982). Deno (1985) demonstrated that "a simple datum like the number of words read aloud correctly . . . [for one minute] from a basal text reliably and validly discriminates growth in reading proficiency" (p. 224). In a related study, Deno, Marston, Shinn, and Tindal (1983) found that "students in learning disabilities programs read aloud more slowly and less accurately than [did] other low-achieving students" (p. 58). They warned that standardized achievement tests were likely to be insensitive to automaticity, which Samuels (1979) and Samuels and LaBerge (1983) consider essential for successful reading and which Ackerman, Dykman, and Peters (1977) believe is a significant cause of reading disabilities. They recommended that oral reading fluency be considered a primary measure of reading ability.

Deno, Mirkin, and Chiang (1982) examined the relationship between reading aloud from basal readers and standardized test performance. They concluded that reading aloud was a highly reliable and valid estimate of "proficiency in both decoding and comprehension" (p. 43). Support for their conclusion was based, in part, on their finding that the number of words correctly read aloud in one minute correlated .78 and .80 with literal and inferential comprehension on the Stanford Diagnostic Reading Test and above .90 with word recognition on the Woodcock Reading Mastery Test.

Findings

Group Comparisons

Given the small n's and the directional hypothesis that students receiving the relaxation treatment would make greater reading gains than students in the counseling treatment, one-tailed nonparametric tests were used to assess the significance of differences. The Mann-Whitney Rank Sums Test was used for between-subjects comparisons. The Wilcoxon Signed Ranks Test was used to assess within-group pre-post comparisons.

Linton and Gallo (1975) noted that "there is nothing sacred" about the .01 or .05 levels of significance (p. 48). The alpha level should be set by a consideration of the consequences of making Type I or Type II errors. In some situations they suggest that an alpha level of .20 can be the better choice. Given the sample size and the consequences of a Type II error, the .15 level was chosen, a priori, for between-subjects comparisons, so as not to conclude that "no difference" exists when in actuality real differences do exist. The .15 level reduces the possibility of disregarding a potentially promising treatment in its initial stages of development due to (1) the limitations of statistical tests which, in part, derive their power from the number of subjects in groups, and (2) the possibility that the treatment needs further refinement to manifest a more potent impact.

In contrast to pre-intervention findings of no significant difference on silent reading as measured by MAT Total Reading Score grade equivalents ($p = .24$), posttest analysis revealed a significant difference between the groups in favor of the relaxation group ($\bar{X}r = 8.95$, $\bar{X}c = 7.10$; $p = .10$).

Single-Case Comparisons

The ABAB design allowed monitoring of oral reading proficiency in the baseline period before the initiation of PMR training, during two intervention phases, and during withdrawal. In essence, subjects were their own controls, allowing for the assessment of effects on individuals.

Figure one presents the effects of PMR training on the four participants. Three of the four demonstrate the idealized ABAB pattern: Their medians and means for (1) Phase I Treatment were higher than those for Baseline; (2) Withdrawal were lower than those for Phase I Treatment; (3) Phase II Treatment were higher than those for Withdrawal. In the one case where the momentum of oral reading was not reversed during withdrawal, the increase of means from Withdrawal to phase II Treatment (reinstatement of treatment) was more than four times as great (118.2 - 108.1 = 10.1; 10.1/108.1 = 9.00% increase) than that of Phase I Treatment to Withdrawal (108.1 -

105.7 = 2.4; 2.4/105.7 = 2.0% increase). Figure two considers the four students as a single-case and provides group means for each segment of the design. It too illustrates the idealized ABAB pattern. However, the aggregate difference between initial treatment and withdrawal are not as dramatic as with subjects one, two, and three, due to subject four not reversing trend during the withdrawal phase.

Table 1 shows the percentage of data points above the mean of the previous phase. It offers another perspective for analyzing oral reading. Concordant with these figures, the vast majority of data points for students one, two, and three display the idealized pattern for an ABAB design.

Donna — One Student in the Relaxation Group

Donna's oral reading continued to improve during the Withdrawal Phase (see Table 1). Although the reason for this cannot be determined with absolute certainty, there is cause to speculate that her continued improvement was due to her internalization of treatment. Donna was the student previously referred to who requested to practice PMR without tapes. It was she who teachers noted continued to engage in PMR exercises by herself in class before tests and classroom reading assignments. This continued throughout the Withdrawal Phase. If we are correct in speculating that Donna's continued PMR efforts influenced oral reading, then the withdrawal design was inappropriate for Donna as treatment, for all intents and purposes, proceed at an informal level. Continuance of treatment likely lessened the potential differences between the withdrawal and intervention phases for the four subjects as a group.

Table 1

Student (Baseline $\bar{x}$)	Phase I (Treatment $\bar{x}$)	Withdrawal (Withdrawal $\bar{x}$)	Phase II (Treatment $\bar{x}$)
	Percent of data points above the median of the Baseline Phase.	Percent of data points above the median of Phase I.	Percent of data points above the median of the Withdrawal Phase.
One	64.3%	25%	77.8%
(59.5)	(69.0)	(63.5)	(78.0)
Two	87.5%	33.3%	81.8%
(120.5)	(135.0)	(127.5)	(148.0)
Three	88.23%	33.3%	90.9%
(104.0)	(124.0)	(116.5)	(133.0)
Four	100%	57.1%	50%
(85.0)	(105.7)	(108.1)	(118.2)

Percent of Oral Reading Data Points Above the Median of the Previous Phase

Discussion

The results of this investigation are promising. They suggest that PMR training can have a positive influence on the silent and oral reading performance of adolescents who are classified as emotionally disturbed. Nevertheless, the results must be viewed with caution as (1) sample size was small, justifying use of a larger than usual alpha level to determine significance ($p = .15$) and lessen the possibility of concluding

that "no difference" existed when in actuality a real difference did exist; and (2) students were not assigned to treatment in a purely random fashion. This latter limitation, however, should not influence the effects of treatment on oral reading in the ABAB facet of the investigation.

Two related limitations of the study are the modest number of total relaxation sessions provided and the weekly frequency of PMR training. These restrictions are important as substantial relaxation practice is usually needed to maximize potential effects and ensure the continuity of benefits. Too few sessions may not provide sufficient opportunity for relaxation to take hold (Benson, 1975; Lichstein, 1988). This makes the present results even more intriguing and suggests that PMR training may ultimately demonstrate considerable value as an adjunct to instruction.

Reading was assessed using the MAT and tallying the number of words correctly read aloud in one minute of oral reading over sessions. In both instances relaxation was associated with a positive effect. On pretesting there were no significant differences between the groups on the MAT. On posttesting the relaxation group scored significantly better ($p = .10$) than the counseling group. In three of four cases, oral reading declined when PMR training was withdrawn as part of the ABAB design and increased again when training was reinstituted. In the fourth case, there is reason to believe that the student continued practicing relaxation on her own during the withdrawal phase. It is important to note, however, that this investigation was a first stage efficacy study and not theoretical research examining mechanisms. It did not, for example, investigate whether PMR training simply helped participants make more effective use of their extant reading abilities or helped them acquire additional knowledge and skill.

Although the taped PMR procedure was administered by a school psychologist, previous relaxation studies have successfully employed classroom teachers with non-classified and exceptional students. The clear structure of the training tapes (e.g., specifying which muscle groups to tense, when to tense and release them) does not seem to require sophisticated psychological expertise, given that the limited purposes of training are to improve academic achievement and lessen general anxiety rather than to provide psychotherapy. Future studies with youngsters classified as emotionally disturbed should investigate the level of training required to successfully administer taped PMR presentations. If, as hypothesized, teachers can successfully induce relaxation via tapes, the strain on scarce resources (e.g., school psychologists, funding) will be less, increasing the likelihood of relaxation training when warranted.

With students classified as emotionally disturbed, it is advisable to have a psychologist involved in the selection and monitoring process, to preclude or eliminate any adverse reactions. Although most people do not experience unfavorable reactions, the adult psychiatric literature indicates that some persons may have a negative reaction.

This study did not demonstrate that overall PMR training was definitively superior to counseling, which was employed as a placebo. It did provide preliminary evidence, however, that PMR training had a more beneficial effect than the particular counseling procedures employed on reading performance and required far less investment of time. Although PNR training appears promising as an approach to assist emotionally disturbed adolescents improve their reading abilities, further research is needed before firmly concluding that PMR training is an effective reading intervention with this population. Future research in this area should use larger samples, consider multiple baseline designs across students and situations, increase the total number of relaxation sessions and frequency per week, assess which components of PMR are most effective, assess the effects of other relaxation approaches (e.g., meditation), contrast live to taped training, simultaneously employ several measures of anxiety and reading ability, and examine the long-term effects of relaxation training on reading and related variables. At present, however, relaxation training seems a promising approach for clinical and research purposes.

References

Ackerman, P.T., Dykman, R.S., & Peters, J.E. (1977). Learning disabled boys as adolescents: Cognitive factors and achievement. *Journal of the American Academy of Child Psychiatry, 16*, 296-313.

Barlow, D.H., Blanchard, E.B., Hayes, S.C., & Epstein, L.H. (1977). Single-case designs and clinical biofeedback experimentation. *Biofeedback and Self-Regulation, 2* (3), 221-239.

Benson, H. (1984). Beyond the relaxation response. New York: Times Books.

Borkovec, T.D., & Bernstein, D.A. (1985). Forward. In J.C. Smith, *Relaxation dynamics* (pp. xi-xiii). Champaign, IL: Research Press.

Borkovec, T.D., Johnson, M.C., & Block, D.L. (1984). Evaluating experimental designs in relaxation research. In R.L. Woolfolk and P.M. Lehrer (Eds.), *Principles and practice of stress management* (pp. 388-403). New York: Guilford.

Cameron, N. (1963). *Personality development and psychopathology*. Boston: Houghton Mifflin.

Charlesworth, E.A. (1984). *The relaxation and self-management program*. Houston, TX: Stress Management Research Associates.

Deno, S.L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children, 52* (3), 219-232.

Deno, S.L. (1986). Formative evaluation of individual student programs: A new role for school psychologists. *School Psychology Review, 15* (3), 358-374.

Deno, S.L., Marston, D., Shinn, M., & Tindal, G. (January, 1983). Oral reading fluency: A simple datum for scaling reading disability. *Topics in Learning & Learning Disabilities, 2* (4), 53-59.

Deno, S.L., Mirkin, P., & Chiang, B. (1982). Identifying valid measures of reading for use in continuous evaluation of educational programs. *Exceptional Children; 49* (1), 36-45.

Glasser, W. (1965). *Reality therapy*. New York: Harper & Row.

Harris, A. (1975). *How to increase reading abilities* (5th ed.). New York: David McCay.

Jacobson, E. (1938). *Progressive relaxation*. Chicago, IL: University of Chicago Press.

Kazdin, A.E. (1982). *Single-case research designs*. New York: Oxford University Press.

Kessler, J. (1966). *Psychopathology of childhood*. Englewood Cliffs, NJ: Prentice-Hall.

Kratochwill, T.R. (1985). Case study research in school psychology. *School Psychology Review, 14* (2), 204-215.

Lichstein, K.L (1988). *Clinical relaxation strategies*. New York: Wiley and Sons.

Linton, M., & Gallo, P.S. Jr. (1975). *The practical statistician*. Monterey, CA: Brooks/Cole.

Lupin, M. (1977). *Peace, harmony, awareness: A relaxation program for children*. Allen, TX: DLM Teaching Resources.

Margolis, H. (1987). Self-induced relaxation: A practical strategy to improve self-concepts, reduce anxiety, and prevent behavioral problems. *The Clearing House, 60* (8), 355-358.

Margolis, H. (1988). *Relaxation training:. A promising approach for helping exceptional learners*. Manuscript submitted for publication.

Margolis, H., & Pica, L. (1987). Effects of relaxation training on the reading achievement of learning disabled students: A series of single-subject AB studies. *Reading, Writing, and Learning Disabilities International, 3* (4), 345-356.

McGinnis, D.J., & Smith, D.E. (1982). *Analyzing and treating reading problems*. New York: Macmillan.

Samuels, S.J. (1979). The method of repeated readings. *The Reading Teacher, 32*, 403-408.

Samuels, S.J., & LaBerge, D. (1983) A critique of A theory of automaticity in reading: Looking back: A retrospective analysis of the LaBerge-Samuels reading model. In L.M. Gentile, M.L. Kamil, & J.S. Blanchard (Eds.), *Reading Research Revisited* (pp. 39-55). Columbus, Ohio: Charles E. Merrill.

Smith, J.C. (1985). *Relaxation dynamics: Nine world approaches to self-relaxation*. Champaign, IL: Research Press.

Graphs from "The Effects of Audiotaped Progressive Muscle Relaxation Training on the Reading Performance of Emotionally Disturbed Adolescents"

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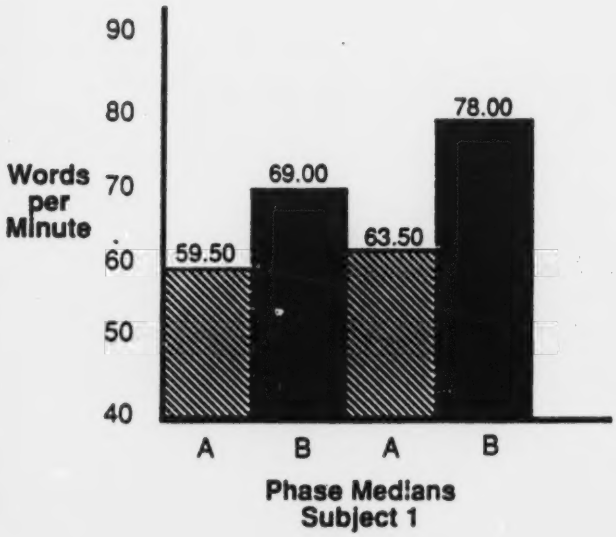
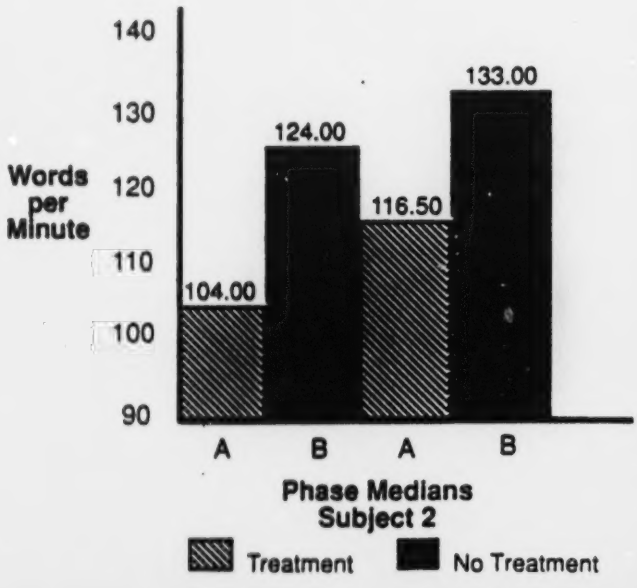
Abstract

The present investigation examined the degree to which audiotaped progressive muscle relaxation training influenced the oral and silent reading performances of adolescents who were legally classified as emotionally disturbed. A single-case ABAB withdrawal design was used to examine the effects of relaxation training on oral reading. In addition, a quasiexperimental between-subjects pretest-posttest design was used to contrast the effects of relaxation training and group counseling on the Total Reading Score of the Metropolitan Achievement Test. Withdrawal design findings indicated that relaxation training positively influenced oral reading performance. Between-subjects comparisons showed that the relaxation group did significantly better on the MAT posttest than the counseling group.





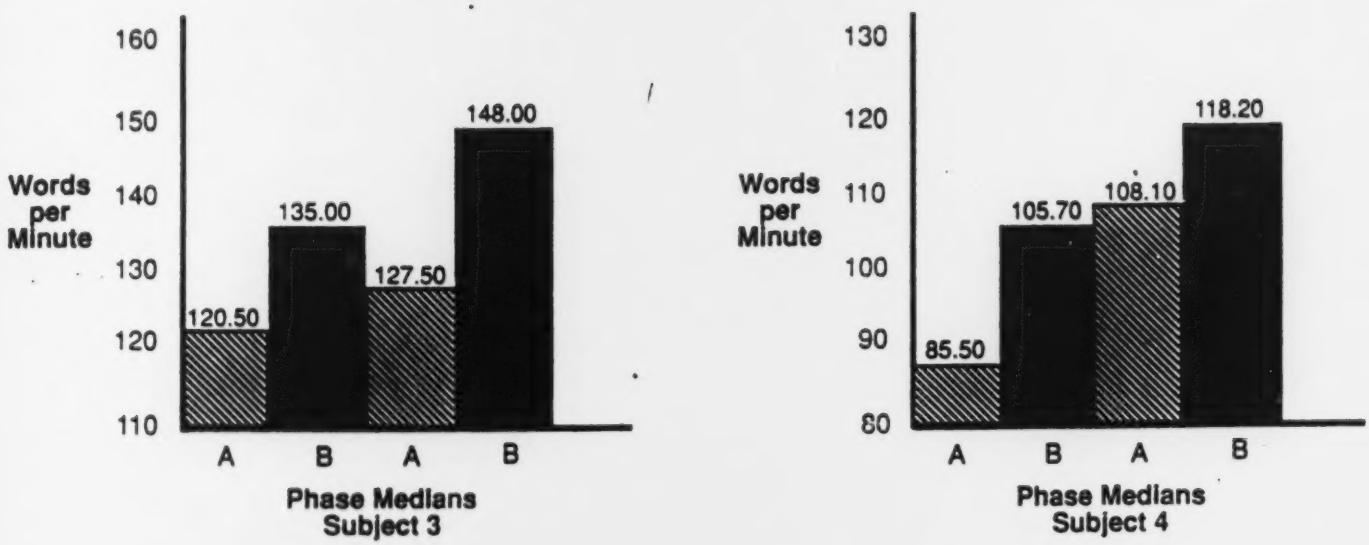


Figure 2 - Group Means By Phases